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Notes on Milk Fever and Allied Diseases*

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In introducing the subject of milk fever, I wish to express my thanks for and appreciation of the biochemical analyses undertaken by Drs. H. H. Green and Wm. M. Allcroft, of the Ministry of Agriculture and Fisheries, Weybridge, without which it would be impossible for me to discuss this disease in its wider aspects, since my conclusions are based on their analytical reports on 100 cases of milk fever and associated conditions. The work of Drs. J. Russell Greig and Henry Dryerre is so well known that one need only mention, in passing, how much we are indebted to them for their investigations and for the introduction of calcium therapy.

The average milk fever case is usually met with about 20 hours after calving, although cases are sometimes seen at the time of parturition and as long as six weeks after. When a cow goes down on the third or fourth day after calving it is not unusual to find that the case is not one typical of milk fever.

The blood analysis of a typical case shows hypocalcaemia, hypophosphataemia and frequent hyperglycaemia, while the magnesium value is usually within the normal range, but with a tendency to run high. The analyses of blood samples from 73 cows, mostly cross-bred Lincoln Red Shorthorns, which I diagnosed to be suffering from milk fever, showed the interesting averages :—

Serum calcium 4·7 mg. per cent., and serum magnesium 2·5 mg. per cent.

The hypophosphataemia is generally accepted as being of no great significance.

Milk fever cases respond well to a subcutaneous or intravenous injection of calcium-boro-gluconate, the quantity used being 3 oz. in 16 oz. of water at blood heat. Early in the year and again in the autumn (and early winter) I have had better results by increasing the dose—using the same concentration—by 50 to 100 per cent. When inflation is resorted to at the second visit the cow may be up in three to four hours, even although six hours or longer may have elapsed between the injection and the inflation treatment. While this may point to the inflation treatment being more rapid in its response, the part played by the calcium boro-gluconate must not be overlooked. If, however, the cow is worse at the second visit, then inflation is clearly indicated as being more useful in that particular case. Sometimes 16 oz. of calcium-boro-gluconate is given intravenously and 8 oz. subcutaneously. Although a number of good results have been obtained, the rapid recoveries attributed to the intravenous injection of calcium-boro-gluconate have not been my experience. I must confess that it is generally the most advanced or comatose case that is treated by intravenous injection.

When intravenous and subcutaneous injections are given simultaneously the patient can be left overnight and the practitioner relieved of anxiety. There is little doubt that the response to calcium therapy is best during the summer months, when most cases are encountered, and there is some evidence to show that those cases exhibiting very little rise in the blood acetone will make the most rapid recovery.

Coramine given intravenously is, in my experience, the most useful cardiac and respiratory stimulant. If, on revisiting a case, the practitioner is satisfied that the milk fever symptoms have disappeared, even although the cow is still down calcium therapy should be withheld. In the first place it can do little or no good, and secondly, the farmer will appreciate the practitioner's prognosis, especially if an estimate of when the cow may be expected up has been given.

It has been shown in cases of mistaken diagnosis that a hypocalcaemia case may respond to magnesium therapy, and a hypomagnesaemia case to calcium therapy, although the response may be slow.

There is a tendency to give a subcutaneous injection of magnesium sulphate when calcium therapy appears to have failed ; care should be taken to avoid this unless evidence of a hypomagnesaemia exists, since it frequently happens that when response to treatment is slow there is a deviation from the normal level in both magnesium and calcium values, a common alteration being a *hyper*magnesaemia. When calcium and magnesium variations are present, an accurate diagnosis is sometimes most difficult, and the response to treatment slow or unsatisfactory.

One may be apt to expect a typical milk fever, or hypocalcaemia, because the cow is down 24 to 48 hours after calving, or to have to deal with a hypomagnesaemia or lactation tetany when a call is received to a case which calved six weeks previous to the attack. This, however, is not always the case. Care should be taken, therefore, not to allow clinical experience in general, and the time factor in particular, to outweigh the conclusion which should be drawn from the symptoms presented in a case which may be an exception.

Cases have been injected about 24 hours before calving, to prevent milk fever in animals which have previously gone down, with apparently good results. It has not, however, been possible to say that an attack has been prevented, as a cow may go down on two successive occasions, miss one year and then have an attack of milk fever or allied disease in the fourth year.

An injection of calcium-boro-gluconate has, in my experience, prevented the occurrence of hypocalcaemia when the blood calcium has already commenced to fall and before any symptoms accompanying this condition are showing ; but if the disease has *not* begun to make its appearance when the injection is given, the calcium administered will be eliminated without having any beneficial effect, and the blood calcium previously present will still fall below normal and the cow will still go down unless the first injection is followed up by a second or third within a few hours.

The most common cause of death in milk fever cases in my practice is pleurisy, probably associated with chronic apical pneumonia, which is, usually due to delay, a condition difficult to establish at a *post-mortem* examination of a milk fever case, but which has been seen, on occasion, where fresh specimens have been examined when acting under the Tuberculosis Order. (Chronic apical pneumonia would appear to be a disease worthy of further investigation.)

Of the 73 cases discussed, 67 made good recoveries and six died ; of these six, three showed pleurisy ; one, thoracic and abdominal tuberculous lesions ; a fifth died following prolapse of the uterus and the sixth cow from a dislocated neck as a result of struggling whilst tied by the horns.

LACTATION TETANY

Most lactation tetany cases are seen in the spring when the cows have been a few weeks at pasture, or in the early winter when a change is made to winter feeding.

Symptoms seen in milk fever cases are also present in lactation tetany, but usually in a more marked degree, tetany in particular being more pronounced. The disease is sudden in its onset and may be associated with oestrus. The cow may be seen to fall in the field or in the milking shed. Opisthotonos is often encountered, with rolling of the eyes, dilatation of the pupils and muscular twitching of the eyelids. The quivering of the eyelids is more distinct and more persistent than in milk fever cases. There is often a staring eye, marked excitement and evidence of rage.

* Paper presented to the meeting of the Lincolnshire and District Division N.V.M.A., held at Lincoln, October 16th, 1941.

Tetany frequently affects all four legs, and sometimes muscular twitchings will be seen in one or more sites, *e.g.* the head, the neck, muzzle or flanks. The head may sway from side to side, or, when down, the cow will paddle with the forefeet. Groaning may also be in evidence, as in milk fever cases, and sweating over the back and sides. The temperature in lactation tetany is elevated, the average of eleven cases was found to be 102·0° F. Acute cases will be found down and generally lying fully extended on the side. In these cases it is inadvisable to attempt to prop them up until an hour or two after injection.

One case occurred 25 days after calving. The longest period after calving was 120 days and the average of twelve cases was 59 days.

In lactation tetany the blood analysis shows a hypomagnesaemia and a moderate fall in the serum calcium; the average of 13 "bloods" was:—

Magnesium—1·0 mg. per cent. and calcium—7·4 mg. per cent.

Lactation tetany cases respond to magnesium therapy. The magnesium injection generally used is a 30 per cent. solution of magnesium sulphate in 5 oz. of water. This was the quantity used at one time by Mr. J. R. Barker, but larger doses, in my experience, are preferable.

Unless the animal shows early signs of improvement the success of the treatment is considered unsatisfactory. Cases showing opisthotonos always die. Repeated magnesium therapy is generally unsatisfactory, but in view of the fall in calcium, both magnesium and calcium therapy would appear advisable.

The extent of the fall in magnesium bears no direct relation to the progress of the case. The cow showing the lowest magnesium value recovered after magnesium therapy—this cow had not gone down.

The main hope of a satisfactory response seems to be in very early treatment, preferably before the cow has gone down.

Mortality is high—about 60 per cent.

Ketonaemia

Clinical cases of this disease are usually recognised several weeks after calving, although milk fever cases complicated by ketonaemia are not uncommon.

The most marked symptoms in one fairly typical case of the nervous type, seen two weeks after calving, were as follows: restlessness, biting at the feed trough, licking movements—sometimes licking the foreleg—eating straw and rubbish indiscriminately from the trough. The blood analysis was:—

Calcium ...	9·0 mg. per cent.
Magnesium ...	2·3 „ „ „
Acetone ...	36·0 „ „ „

Treatment: 16 oz. calcium boro-gluconate and 5 oz. magnesium sulphate subcutaneously.

A definite improvement was seen by the afternoon of the same day and the nervous symptoms had disappeared completely by the next day. On this date 400 c.c. glucose solution was given intravenously. Cattle treacle was administered for several days plus laxative and stimulant medicine. Within a week the cow had made a complete recovery. The owner reported that this cow improved slowly in condition each year after calving. It seems probable that she was affected following every calving.

A second case, seen ten days after calving, exhibited none of the symptoms of the case just cited. It was, no doubt, one of the digestive type. The cow showed a slight tendency to sway and pulled the back down when pressed over the loins, leading one to suspect an injury, probably at calving. (Apparent evidence of pain over the loins is known to be a symptom of ketonaemia.)

The blood analysis was:—

Calcium ...	8·4 mg. per cent.
Magnesium	2·5 „ „
Acetone ...	75·2 „ „

The cow made a satisfactory recovery.

Two other cases of less interest come into this group, whilst three other cases dealt with this year, from which no "bloods" were obtained, were confirmed by urine testing.

Post-Parturient Paralysis

This is the type of case that goes down within a day or two of calving; usually later than the typical milk fever case.

The customary symptoms of milk fever are absent, the cow is simply unable to get on her feet; she will often eat and drink normally, the bowel actions are normal and the temperature does not vary. The pupil is usually normal, but may be contracted rather than dilated.

The cow will remain down longer than in hypocalcaemia, and it is often possible to inform the owner that the animal is not expected to be up for three or four days.

These cases of post-parturient paralysis must not be confused with cases of ketonaemia or post-parturient dyspepsia as the ketone value is normal.

Out of seven, the four most typical clinical cases showed blood analyses as follows:—

	Calcium Mg. per cent.	*Magnesium Mg. per cent.*
Case No. 6	8·0	1·7
„ 6 (relapse sample) ...	8·7	1·7
„ 39	7·5	3·2
„ 51	9·4	1·3
„ 102	9·1	1·3

These show a moderate fall in serum magnesium, which, however, is still above that for a typical hypomagnesaemia case; no symptoms to suggest lactation tetany were present.

No. 6 went down one day after calving. The cow was given calcium boro-gluconate subcutaneously and was on her feet next day. Four days later she was down again and recovered in 24 hours to the same treatment.

No. 39 was attacked one day after calving; treatment—calcium boro-gluconate on the first day, administered subcutaneously. Two days later powders consisting of pulv. nucis vom. and pulv. ammon. carb. were given. The cow was on her feet the next day.

No. 51 was down 13 days after calving; treatment—14.4.39 at 10 o'clock a.m.—calcium boro-gluconate subcutaneously; at 4.30 o'clock p.m.—magnesium sulphate solution subcutaneously. From the morning of the 16.4.39 tonic powders were given as in the case of No. 39. The cow was up and normal in the evening of the following day.

No. 102 was affected one day after calving. It was up the same evening following a subcutaneous injection of calcium boro-gluconate. (The calcium estimation on clinical examination was entered in my report schedule as 9·0 mg. per cent.). The previous year this cow was similarly affected but did not get up for six days.

In the other cases met with there has been very little variation in the calcium or magnesium values, either singly or together. Consequently diagnosis has been more difficult and response to treatment has been slow. I recall having seen more of these cases in Scotland.

Unclassified Cases

Of the remaining cases, one diagnosed as post-parturient paralysis was thought by another veterinary surgeon to be a case of lightning stroke. As the *post-mortem* examination made by my colleague on this cow was not carried out until ten days after the onset of the illness and as I have no record of the *post-mortem* examination, the cause of the illness remains obscure.

One case diagnosed as lactation tetany was shown from the biochemical analysis to be a hypocalcaemia and a *hyper*magnesaemia; nevertheless a slow response was obtained to magnesium therapy. This was a most interesting case, occurring six weeks after calving. The blood analysis was as follows:—

Calcium 3·6 mg. per cent. and magnesium 3·3 mg. per cent.

Treatment—magnesium sulphate and one-fifth of the usual dose of calcium boro-gluconate subcutaneously.

The cow was up in four hours, but had a relapse the next day. The blood analysis at the time of the relapse was—calcium 3·7 mg. per cent. and magnesium 4·0 mg. per cent.

Treatment—one injection of camphor in oil and 20 oz. of the usual magnesium sulphate solution, given as three separate injections at intervals over a period of 24 hours.

The cow was up and normal 48 hours after the second attack.

Another case diagnosed as delayed milk fever, but showing tetany of all four legs, one month after calving, was, on blood analysis, shown to be a mixed case with hypocalcaemia and hypomagnesaemia; this case responded to calcium boro-gluconate subcutaneously.

A Note on the Examination of Nose, Throat and Vaginal Swabs and of Dung Samples for the Presence of Str. agalactiae

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Recently many investigators working on bovine streptococcal mastitis have suspected that the udder may not be the sole site of the causative organism, *Str. agalactiae*.

This belief receives some support from the work of Hare and Colebrook[1] who found Lancefield Group B streptococci in the human vagina.

Nose and throat swabs were taken from 74 cows, all except six of which had been proved by Edwards's technique[2] to be suffering from streptococcal mastitis or harbouring the organisms in the milk.

Vaginal swabs were taken from 20 virgin heifers and 56 cows of which 15 were found to be harbouring *Str. agalactiae*.

Dung samples from 24 cows suffering from clinical streptococcal mastitis were also examined.

Each swab was made from a 12-inch length of copper wire, one end of which was bent into a loop for holding, the other having a piece of cotton wool twisted round it to form a cylinder about half an inch in diameter and 2 inches long. The cotton wool was held in place by bending the wire over it, twisting the cotton wool and binding it with a few inches of cotton thread. The swab was then placed in a test tube, the tube plugged (leaving a length of the wire outside), and sterilised in the autoclave.

After each swab had been used it was replaced in the tube, which was replugged, and taken to the laboratory for examination.

The treatment of the swabs was as follows :—

(*a*) The swabs were streaked direct on agar plates and after 24 hours' incubation any suspicious colony was transferred to broth and incubated overnight.

(*b*) After streaking the plate the swab was replaced in the tube and 10 ml. of broth added and the whole incubated overnight. A further series of agar plates was then streaked with a loopful of this broth and the plates treated as in (*a*).

(*c*) 1 ml. of the broth in which the swabs had been incubated was added to a tube containing 9·5 ml. of sterile separated milk and 0·5 ml. of a 0·5 per cent. solution of brom-cresol purple and incubated for two days, when any tube showing acidity was streaked on agar plates and dealt with as before.

Edward's aesculin-crystal violet-blood agar and serum-destrose-lemco broth were used throughout and all incubation took place at 37° C.

The dung samples were collected either direct from the rectum of the cow or immediately after dropping in the byre. As with the swabs, a loopful was streaked direct on agar plates, and another loopful incubated in broth. After incubation a loopful of this broth was streaked on an agar plate and 1 ml. added to a brom-cresol purple milk tube. Times of incubation were the same as for the swabs.

All suspicious colonies isolated from both the swabs and the dung samples were examined and all streptococci tested biochemically and against a Group B serum using the Lancefield technique.

No Lancefield Group B streptococci were isolated. These results, though completely negative, may interest other workers.

References

[1]Hare, R., and Colebrook, L. (1934.) *J. Path. Bact.* **39.** 429.
[2]Edwards, S. J. (1933.) *J. comp. Path.* **46.** 211.

Still another cow, which had calved nine days previously, was, after a journey by lorry of 17 miles, found down on arrival at the farm. The blood analysis—calcium 6·1 mg. per cent. and magnesium 0·4 mg. per cent.—showed the case to be one of transit tetany. This was not unexpected although tetany was not marked. Recovery took place in two days after administration of calcium and magnesium.

CLINICAL COMMUNICATIONS

Formalin in the Treatment of Mastitis

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Some years ago, when treating a case of acute mastitis in a Shorthorn cow, I had an experience which confirmed my faith in the efficacy of the above treatment.

One of the patient's quarters had become hot, and from the teat could be drawn a dirty yellow-coloured watery fluid with a few clots. It being a common case I did not have any laboratory tests made, but gave the cow my routine treatment which was one fluid ounce of 40 per cent. formaldehyde solution in a quart of water as a drench twice a day, and a salve of camphor in curd soap for external application to the affected quarter.

As was my custom, I advised the farmer not to use the milk from the unaffected quarters for sale in case it was tainted.

The cow began to recover almost immediately and was soon well.

Later, when visiting the farm, I was asked by the farmer why I put on the bottle label of my "Udder Ill mixture" that the milk from the unaffected quarters should not be used for sale, because he had used the milk in his own house and had noticed nothing wrong with it, the only difference being that it had "*kept better*" than the milk from his other cows.

This unsolicited observation from a man who did not know what to expect was, I thought, a strong point in favour of the above treatment because it suggests that formalin when excreted through the udder exerts a stronger and more lasting bactericidal effect than that with which it is usually credited.

The salve was very popular with the farmer, but I do not think that it exerts much beneficial effect; the prescription is an old one and I am afraid that I have left it in England, so am unable to reproduce it here. I could, however, obtain it if anyone is interested.

Information or reference on any clinical or laboratory work carried out which confirms or refutes my conclusions would be welcome.

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A Method of Treatment of Suppuration of the Para Anal Sinus of the Dog

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As far as the writer's information goes, excision of the infected sinus is the usual method of dealing with this condition. The operation *may* be simple but it is one involving cutting and an attempt has been made to find an alternative method.

This consists in injecting a sclerosing fluid into the sinus to destroy the secreting glands by fixing their cells.

The fluid used is a modified Carnoy's fluid: ferric chloride, one drachm; glacial acetic acid, 1 c.c.; absolute alcohol, 6 c.c.; chloroform, 3 c.c.

During the past eight years the method has been employed in all cases of chronic infection and the apparently caustic fluid does not at any rate add to the inflammation of the surrounding skin which may happen to be present. In many cases this redness has greatly subsided within 24 hours. The patient is given morphine. Most cases can be treated in this manner but if quietude is not maintained so that complete relaxation has taken place then pentothal or nembutal should be given.

A fine-size Horrock's blood cannula is attached to a 5 c.c. all-glass syringe through the medium of a rubber adaptor with Record mountings at either end. If an ordinary Record syringe is used it should be an old one as the ferric chloride will damage it and it should be immediately washed through after use. Horrock's cannula is all silver and does not corrode.

The dog is laid on its side and the tail is elevated by an assistant. The orifice of the sinus is located, at about the junction of skin and mucous membrane, by a gentle downward movement of the tip of the middle finger on the skin close to the anus.

The cannula is guided, probe-wise, down into the very bottom of the sinus after it has been most thoroughly emptied by the bare fingers. The fluid is then gently injected until it oozes out or if the cannula completely fills the orifice, sufficient should be injected to distend the sac.

No further treatment should be carried out for a week or two, so as to allow ample time for atrophy to take place.

Gentle upward massage should be practised daily to empty the cavity of the serum which has accumulated.

The method may be applied to fistulae of the sinus and ordinarily in these cases narcosis is not necessary.

It is not recommended for acute inflammatory conditions; other methods should be used in the first instance.

An apology is offered for introducing such a trivial matter to the columns of this paper and the operation is not offered as an exercise for obtaining skill in other more important directions.

It might be mentioned that the same technique is quite effective in the treatment of even large sebaceous cysts.

The important point is to give the fluid every facility for making contact with the secretory surface.

COMPREHENSIVE BRITISH VETERINARY JOURNAL PROPOSAL: AMERICAN COMMENT

The following editorial article, entitled "Proposes the Amalgamation of the British Veterinary Journals" appearing in a recent issue (1941, July) of our American contemporary, *The Journal of the American Veterinary Medical Association*, presents wise and useful comment on a topic of some urgent concern to the N.V.M.A.:—

"A Dublin correspondent of *The Veterinary Record* pleads for 'a comprehensive veterinary journal' to replace *The Journal of Comparative Pathology and Therapeutics* which was lost to the readers of the English language last year through the death of Sir John M'Fadyean. The plea is for a journal that 'would give some index of our high standing in science. . . .' The impulse is comparable to that which prompted the A.V.M.A. to establish *The American Journal of Veterinary Research*. But what the correspondent (*loc. cit.*) does not seem to realise is that the journal of a national society has other things to do besides filling white space to solicit a 'high standing in science.' It has a profession to keep in order for the public good. Its editors and its inner council regard 'high standing in science' as but one of many means of accomplishing its purposes. The periodical of a veterinary society should not be expected to print the details of science for vanity's sake only, and thereby bore a large percentage of its readers with material they can neither understand nor ever use. There are proper media for gazetting the minute details of scientific research, and these media are not necessarily the journals of the professional associations. In the councils of the latter, public welfare through guidance of a membership is the objective. In the higher branches of science, nothing matters but science itself. The one is concerned with science, the other with its proper application in the interest of the general population. So the two fight a verbal duel to no good purpose.

"The situation was exemplified in the United States. With the ever-increasing growth of the A.V.M.A., the membership engaged in clinical work clamoured for a 'more practical' journal. The scientific articles displeased the majority. On the other hand, those in the field of research, waiting in vain for the publication of their manuscripts, were also displeased. Neither could be appeased until journals for each field were established. Our 'research journal' fills the place in the United States and Canada that Sir John's periodical filled in Britain. It is, therefore, understandable why the editor of *The Veterinary Record* (official organ of the N.V.M.A.) objects to the implication that that 53-year-old journal should be superseded by 'a comprehensive veterinary journal' to satisfy the upper echelon.

"*The Veterinary Record* holds together the veterinary profession of the British Empire by telling weekly the story of veterinary science, veterinary practice and of the veterinary profession, and as the editor declares, its pages are open for the portrayal of high standards. So, it does not want to be merged with other journals for mere vanity's sake. To that we agree, for wherever English is read *The Record* has been welcome. It has 'utilitarian' written on every page. While we, too, miss *The Journal of Comparative Pathology and Therapeutics*, we feel that time will somehow replace it without having to change the name, style, aim or status of Britain's well-known weekly."

ANNOTATION

The Future of Pharmacology

A decade ago one of the most eminent authorities of the day stated that pharmacology was the most neglected branch of medicine, that the practical aspects of the subject were insufficiently accentuated and that British pharmacology was much behind that of other countries in the production of new remedies (Dixon, 1929). Whether these faults are still to be found to-day is considered by Professor J. A. Gunn in the Third Dixon Memorial Lecture which he delivered before the Section of Therapeutics and Pharmacology of the Royal Society of Medicine in May of last year (Gunn, 1941). Review of this address gives rise to the question of whether this criticism is also applicable to the present position of veterinary pharmacology.

The Development of Pharmacological Research

The importance of pharmacological research became evident during the second half of the 19th century when the first step was the examination of the existent *materia medica* of plants and inorganic compounds, the use of which was almost entirely based on empiricism. This led to the commencement of the removal from the Pharmacopoeia of such drugs as owed their position to superstition and witchcraft. Apart from the investigation of other plants and substances only occasionally employed, the next main development was the attempt to isolate pure active principles from the various plants. The discovery of many of these active principles gave drugs which were more constant in action and often more convenient to administer, also actions more useful than those already known were revealed—for example, coca leaves were chewed to relieve fatigue and produce mental stimulation but isolation of the alkaloid cocaine was necessary before the local anaesthetic effect was discovered.

Concurrently with this investigation of plants and natural inorganic substances some of the products of synthetic chemistry were found to have a certain value in therapeutics. The realisation of this fact widened the scope of pharmacological research to an enormous extent as is becoming increasingly evident to-day.

The modern developments in the field of pharmacology and therapeutics have been summarised as follows:—

(i) Those associated with immunity in relation to bacteriology.

(ii) The recent advances in hormone and vitamin physiology.

(iii) The production by organic chemists of synthetic remedies, some by modification of the normal constituents of the body and some completely new products which have certain desirable actions in disease (Trevan, 1938).

The Relationship of Pharmacology to the other Ancillary Sciences of Medicine

Pharmacology is of necessity closely linked with chemistry, physiology, bacteriology and pathology. It is only through such a combination that a scientific basis can be formed for successful clinical practice. Only thus can "The Science" supersede "The Art" of medicine. There is no doubt that physiology is essentially bound up with pharmacology. It has been stated that one of the most important steps taken in medicine was the investigation of the action of medicaments by the methods of experimental physiology (Dixon, 1929). It is obvious that chemistry is the foundation for the isolation of active principles and the synthesis of new remedies.

It is not always realised that this search for new compounds of therapeutic value involves synthesis on a very large scale. By 1938 over 140 variants of sulphanilamide had been prepared, none of which was sufficiently superior to the existing compound to warrant production (Trevan, 1938). At the present time the total of compounds of this group that have been synthetised and tested must have far exceeded this number. It is for this reason that so far as research in chemotherapy is concerned the commercial laboratory is better able to tackle this problem than any academic institution because no university or college could possibly finance such an undertaking. The recent formation of the Therapeutic Research Corporation of Great Britain by five of the leading manufacturers of medicinal products in this country is a welcome innovation in the British pharmaceutical industry

and it should provide the answer to Dixon's criticism about the poor production of new medicinal substances. This does not mean that such research should be confined to the commercial firm as much valuable work can be done in other laboratories in the critical investigation of new remedies with the publication of unbiased reports on their worth.

In the past bacteriology has been mostly associated with pharmacology with regard to the direct action of drugs on bacteria; it remains to be seen whether the future does not hold great prospects for the close co-operation of the bacteriologist, the synthetic chemist and the pharmacologist in the application of the products of bacterial activity to the treatment of disease. It is the recent work by Dubos (1939) on gramocidin that suggests this possibility.

The Teaching of Pharmacology

A passage from the Report of the Committee on Veterinary Education in Great Britain (H.M. Stationery Office, 1938) discussing the curriculum for the M.R.C.V.S. Course states: "Pharmacology is really a branch of physiology and is therefore separated from toxicology, therapeutics and pharmacy, which are its practical applications and are of more importance later in connection with medicine; indeed the examination in these latter subjects might be included with that in medicine."

A few years ago a conference on the Medical Curriculum came to almost the same conclusion (*vide Proc. Roy. Soc. Med.* **34.** 476). It is perhaps unfortunate that such a view is so widely held for, as Gunn (1941) points out, pharmacology has its own outlook which is not identical with that of pure physiology, and that men of ability cannot be expected to take the subject up unless a definite academic career is open to them.

Another aspect of the case is considered by Trevan (1938) who recommends that increased attention should be given to the student's training in pharmacology, especially with regard to the judgment of the value of new remedies; in this way a more critical spirit would appear and prevent treatment being swamped by the manufacturers with a mass of good, bad and indifferent material. It is true that the Therapeutic Trials Committee have this end in view and the new Pharmacy and Medicines Bill may also be a help in this direction, but neither is likely to influence the mind of the student.

The Future of Pharmacology

It must be admitted that Dixon's criticisms of 1929 applied equally well to veterinary pharmacology and still apply, with this difference—it is recommended that the subject should occupy an even less important position in the future. Pharmacology is now enjoying an era when it is becoming increasingly possible to prescribe drugs more effective than in the past and the prospects of this era continuing are good.

To a profession pledged to the prevention and treatment of disease, therapeutics must be one of the most important subjects to be considered; it is therefore essential that one of its foremost subservient sciences, namely, pharmacology, be not neglected, especially when it has so much to offer.

W. M. Henderson.

References

Dixon, W. E. (1929.) *Brit. Med. J.* **2.** 138.
Dubos, R. J. (1939.) *Proc. Soc. exp. Biol. N.Y.* **40.** 311.
Gunn, J. A. (1941.) *Proc. Roy. Soc. Med.* **34.** 469.
Report of the Committee on Veterinary Education in Great Britain. (1938.) H.M. Stationery Office.
Trevan, J. W. (1938.) *Proc. Roy. Soc. Med.* **31.** 267.

Government control over the acquisition of motor vehicles has been tightened up. Under the original order it became an offence to acquire an unregistered goods vehicle, private car or bus without a licence. A new order makes several amendments. A manufacturer must not dispose of an unregistered vehicle to a dealer unless a customer of the dealer has a licence to acquire it. A licence will lapse unless the order for the vehicle is placed within one month. Where a vehicle acquired under a licence is taken back by a hiring or hire purchase company, the vehicle must not be disposed of except under another licence.

ABSTRACTS

[I.—THE USE OF GRAMICIDIN AND OTHER AGENTS FOR THE ELIMINATION OF THE CHRONIC FORM OF BOVINE MASTITIS. Little, R. B., *et al.* (1941.) *Amer. J. vet. Res.* 2. 305.

II.—EFFICIENCY OF THE MICROSCOPIC EXAMINATION OF INCUBATED MILK SAMPLES FOR THE DETECTION OF MASTITIS STREPTOCOCCI. Kleckner, A. L. *Ibid.* 313.

III.—THE INFLUENCE OF AN UDDER COCCUS UPON THE ACTIVITY OF MASTITIS STREPTOCOCCI IN MILK. Pounden, W. D., and Johnson, M. M. *Ibid.* 317.]

I. Gramicidin is described as an alcohol soluble, water insoluble, substance isolated from a sporulating soil bacillus and exerting a marked bactericidal effect against *Str. agalactiae*, when injected into the udders of cows suffering from chronic mastitis.

Species of sporulating bacilli capable of producing gramicidin are found in several types of cheese.

In a herd of 116 recently purchased cows, preliminary examination of quarter samples of fore milk showed that 19 animals were harbouring *Str. agalactiae* in 39 quarters. This organism was grown in first tests from the milk of two cows only, while in a third cow the streptococcus disappeared early, following five cultural examinations. Sulphanilamide was given to seven infected cows and in one (the third cow above mentioned), this agent may have been responsible for the disappearance of the infection.

The cows were mechanically milked three times daily on a "rotolactor," the vacuum being 15 inches.

Milk from each cow was studied before and after treatment by a combination of selective cultural tests. Results show that of 16 infected cows the streptococci were eliminated in 12, thus only four cows were disposed of to clear the infection completely. Thirty-two quarters were harbouring *Str. agalactiae* and the organism was eliminated from 28 quarters. Twenty-eight of the 32 quarters were treated by injection with gramicidin and in 14 the streptococci were destroyed on a single injection, nine requiring further treatment.

Five quarters remained infected after repeated injections but one quarter, after treatment with novoxil, responded to gramicidin in oil. Novoxil solution was used successfully in five of ten quarters, a single injection being sufficient in two cows, one of which had been previously injected with gramicidin. Only once was a single novoxil injection effective in a quarter which had received no other treatment.

There was a reduction in milk yield in two cases after the elimination of the streptococci, for which the treatment was found directly responsible.

Gramicidin does not, apparently, cause any toxic reaction when given orally to laboratory animals. Only a mild reaction occurred when gramicidin and novoxil were injected into the affected quarters except that in one case a quarter was severely damaged. Generally it was possible to inject from 20 to 80 mg. of gramicidin oil mixture and to repeat the dose on the second or third day, whilst in some cases 20 to 40 mg. were injected daily, on four consecutive days, without severe reaction. Gramicidin in properly adjusted doses was found to produce a milder reaction than novoxil.

It is interesting to note that Ayrshires reacted more severely than other breeds and when more than one quarter was involved clearance of streptococci took much longer.

Much remains to be learned regarding the action of gramicidin.

Case records are given of both *Str. agalactiae* and *Str. uberis* infections and a table shows the cultural and serological characters of the streptococci isolated before treatment.

II. In comparing the microscopical examination of quarter samples of milk after incubation, with the blood-agar plate method for the detection of mastitis streptococci, the author claims for the former nearly a 100 per cent. efficiency.

In quarter samples from cows known to be infected, the blood-plate method failed to detect in 11·3 per cent., *i.e.*, approximately 87 per cent. efficient, as compared with 0·3 per cent. false positives, approximately 100 per cent. efficient, obtained by microscopical examination.

III. The assumption that the presence of other organisms influences the growth of various streptococci in milk has led the

authors to observe an udder coccus which resembles *Staphylococcus albus* and which appears capable of influencing the activity of *Str. agalactiae* in milk samples.

Thirty-four samples were tested by the Hotis test and all were found to be infected with streptococci. This test is based upon acid formation, the appearance of growth on the sides of the tube and the local change of colour of brom-cresol purple added to the original milk sample. A 24-hour-old broth culture of the udder coccus was added to the test. The udder coccus gives a negative Hotis reaction. Replicates were used with additions of veal broth.

When the culture of udder cocci was added to the 34 milk samples, eleven showed no response, five slight, while in 18 the Hotis reaction was much increased.

Acid production in these tests is primarily due to the mastitis streptococci and, although difficult to estimate quantitatively, was measured by titration with 0·1 N NaOH.

The samples which showed stimulation by the udder cocci showed no stimulation on the addition of veal broth, the stimulation being due to the udder cocci.

A table is shown giving data (in terms of cubic centimetres of 0·1 N NaOH required to neutralise a 10 c.c. incubated sample).

H. F. L.

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[CONTROL OF EQUINE STRONGYLOSIS. Part I: The Effect of Natural Factors on the Development of Strongylosis in Foals. Baker, D. W., Salisbury, G. W., and Britton, J. W. (1939.) *Cornell Vet.* **29.** 297-308; Part II: The Effect of Anthelmintic Treatment of Mares on the Development of Strongylosis in Foals. Salisbury, G. W., Baker, D. W., and Britton, J. W. (1940.) *Cornell Vet.* **30.** 367-375; Part III: The Effect of Pasture Management on the Development of Strongylosis in Foals. Britton, J. W., Salisbury, G. W., and Baker, D. W. (1941.) *Cornell Vet.* **31.** 289-294.]

Baker, Salisbury and Britton have made a study of the development of intestinal strongylosis in a group of growing foals during an average year. After outlining the methods of their experiments they discuss the results obtained from egg counts made over a five-months period on seven pure-bred Percheron and five pure-bred Belgian mares and their foals. The average number of e.p.g. per mare over the period varied between 1,400 and 3,950, while the computed theoretical number of infective larvae to which the suckling foals were exposed varied between 16 and 82 billions. The faecal egg count of the foal four months after weaning was taken to represent the infection acquired during the five months' suckling period and this varied from 700 to 3,100 e.p.g. The rate of pick-up of infection was determined by dividing the number representing each foal's exposure to infection by its egg count four months after weaning; the average pick-up rate for all foals was 1 in 32,000,000. There were indications of age resistance to *Ascaris equorum* and to *Strongyloides westeri*. The remarkably low number of infective strongyle larvae picked up by the foals from the tremendous number available to them during the suckling period suggested to the authors the operation of natural factors tending to limit the development of eggs and larvae on pastures. These factors they divide into three groups: (1) those affecting the development of larvae from eggs, (2) those affecting the transmissibility of infective larvae and (3) those affecting the parasitic development in ingested larvae. In the first group, temperature and other environmental conditions are important. Thus in freshly-passed unspread horse faeces deposited at the end of the pasture season it was found that, of the eggs remaining on the pasture, 13, 50 and 68 per cent. failed to hatch after 65, 90 and 150 days respectively. In spread samples of faeces, however, 81 per cent. of eggs failed to hatch after 65 days and no infective or pre-infective larvae were observed after 90 days. From these data the authors recommend chain-harrowing of pastures in the autumn as a valuable procedure as this spreads the faeces and exposes the eggs and larvae to the adverse conditions of winter environment. Dealing with the second group of factors, experiments were made to find whether larval activity had any effect on the duration of larval life. Larvae, whose physiological age was estimated by staining their fat content with Sudan III, were submitted to different temperatures and it was found that the more active the larvae were the more quickly they lost their food reserve of fat. Thus many larvae on ingestion may be too weak to establish themselves in the host. With regard to the third group of factors, a greater resistance was observed among the Belgian foals than among the Percheron foals since the average rate of pick-up of larvae by the former was 1 in 52,600,000 while by the latter it was 1 in 17,000,000. The authors consider the resistance factor an important one.

II. In this second paper, the authors report on the results of an experiment to determine the effect of treating brood mares for strongyle infestation during the winter before the birth of their foals. They compare their results with those given in their first paper. Six pure-bred Percheron and five pure-bred Belgian mares and their foals were used; one foaled in January, a second in February, two in April and seven in May, 1939. The two mares foaling in January and February did not receive anthelmintic treatment but the others each received 50 c.c. of carbon tetrachloride in early November, 1938, and seven of these a second dose of 25 c.c. of the same drug in February, 1939. All the treated mares gave negative strongyle egg counts from faeces two weeks after treatment. All animals were kept in individual box stalls, in which the bedding was kept reasonably fresh and dry and from which the manure was removed daily; they were fed from the floor of the stalls. The first mares and foals went out to grass in early May, 1939, and all foals were removed from the experimental pastures and weaned at about five months old. It was found that the average rate of pick-up of strongyle infection by the foals, running under excessively dry pasture conditions and following a 39 per cent. decrease in the average exposure per foal as a result of treating the brood mares, was 39 per cent. less than the rate of pick-up during the previous year when the foals were run under natural conditions and the mares not treated. The low strongyle egg counts from foals' faeces at weaning time suggest that treatment then is valueless. The general condition of the foals was superior to that of the previous year in every respect; there was far less diarrhoea, almost no cachexia and all foals made satisfactory growth throughout the year, in striking contrast to the rather poor condition, dullness and unthriftiness of most of the 1938 foals. There were further indications of both breed and individual resistance. The eggs of *Strongyloides westeri, Trichostrongylus axei, Ascaris equorum* and strongyles first appeared in the foals' faeces at about 22, 33, 94 and 95 to 120 days after birth respectively. One foal showed *Ascaris* eggs continually in his faeces from the 22nd day after foaling, which would suggest a pre-natal infection.

III. In this third paper the authors describe their attempts to reduce the rate of pick-up of infection by foals by relying on pasture management and environmental factors suspected of being lethal to parasite eggs and larvae. Five pure-bred Belgian and five pure-bred Percheron mares and their foals and 20 pure-bred Belgian and Percheron open mares, geldings and fillies were used and none went out to pasture, because of the late spring, until late May, 1940. Prior to this date they were kept in box stalls, bedded with clean dry straw and from which the manure was removed daily, but the mares were not fed from the floor as in previous experiments. The foals were weaned and removed from the experimental pastures at five months old. The same three pastures used in 1938 and 1939 were again used but were given a dressing in the winter of 1939 of 1,500 lb. ground limestone and 300 lb. of 32 per cent. superphosphate per acre and the manure was spread after the mares had left in late 1939. A table is given showing the dates on which the various animals were on the different pastures and also when the latter were free and being rested. Discussing the results, the authors show that under a system of rotational grazing of improved pastures the average egg count of the foal's faeces was 74 and 45 per cent. less than that of the 1938 and 1939 foals respectively. Further, the rate of pick-up of infection by the 1940 foals was 74 and 57 per cent. less than by the 1938 and 1939 foals respectively. The condition of the 1940 foals was much superior to the 1938 foals and significantly better than the 1939 foals; there were no cases of scouring in the animals under the rotational grazing plan, in sharp contrast to the high incidence among the 1938 foals. The experimental pastures were likewise in better condition after the 1940 season than during either of the two preceding years. Results again indicated the futility of worming foals at weaning time and the authors maintain that it is not economical to worm foals until they are at least nine months old. Brood mares can be wormed with phenothiazine just before they go to pasture and this procedure in conjunction with rotational grazing of improved pastures would appear, in the authors' opinion, to be the ideal method for controlling parasitism in foals.

J. N. O.

[THE EFFICIENCY OF SOAPS AND OTHER DISINFECTANTS IN DESTROYING MASTITIS STREPTOCOCCI. McCulloch, E. C. (1940.) *Amer. J. vet. Res.* **1.** 18.]

In the control of mastitis a disinfectant is required for destroying streptococci on the hands of milkers and on the teats of the cows.

Various chlorine compounds are commonly used but many are found to be slow in action unless they are of low alkalinity and some skins appear to be sensitive to its long-continued use.

Solutions of soaps and soap powders in the presence of 5 per cent. skim milk were more than twice as effective in killing mastitis streptococci as phenol and so appear to be the disinfectants of choice. Medication of the soaps made only a slight difference.

Formalin tested under similar conditions gave very poor results.

G. J. G. H.

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[THE HISTOPATHOLOGY OF CANINE LEPTOSPIROSIS. Bloom, F. (1941.) *Cornell Vet.* **31.** 266-288.]

A detailed study was made of nine dogs with leptospiral infection. The urine and blood were examined during life and the blood examination included the cellular picture and various chemical determinations. Examination of urine and blood by the dark ground method was found unsatisfactory as a method of diagnosis during life, although it was a reliable method when applied to liver and kidney scrapings at autopsy. Silver impregnation of fixed tissues, especially the liver and kidney, was also a good method of demonstrating the organisms.

The urine showed albumen and casts and a number of red blood cells and leucocytes; in three animals it contained bile. The blood picture was that of anaemia and leucocytosis. There was no alteration in the blood platelets. Blood urea was raised.

Five of the animals were icteric and these lived from three to ten days. The remaining four dogs did not develop icterus and survived from one to six weeks.

In the icteric group the microscopic lesions comprised: haemorrhage, oedema and neutrophil leucocytic infiltration of the gastric mucosa; presence of free red blood cells in the sinuses of lymph nodes and their phagocytosis by macrophages (erythrophagia); pulmonary haemorrhages; degenerative and inflammatory changes in the kidney consisting of destruction of tubular epithelium in some areas and regeneration in others and focal interstitial collections of inflammatory cells.

The dogs which did not become icteric showed similar lesions but the renal changes were more marked and there were massive infiltrations of mononuclear cells, together with a few neutrophil leucocytes, histiocytes and plasma cells.

Other lesions which were present are considered as secondary to the uraemia which developed and are not specific for leptospirosis. These changes included calcification of the myocardium, costal pleura, endocardium, pulmonary artery and aorta and were sometimes associated with necrosis and inflammatory changes.

The lesions occurring in the kidney can be classed as an acute or subacute interstitial nephritis, a change which is seen in a large variety of pathological conditions in dogs. The author has seen it in association with pyometra, metritis, prostatitis, distemper, pneumonia, acute and chronic valvular endocarditis, cardiac interference due to neoplasia of adjacent tissues, and in chronic infections such as otitis, anal pouch infections, and chronic peritonitis. It is possible that recovery from leptospiral infection may be followed by chronic interstitial nephritis (chronic contracted kidney).

The rise in blood urea is due to uraemia and the latter is responsible for many of the symptoms and lesions of leptospiral infection. The neutrophil leucocytosis is not specific and is characteristic of infections in general.

E. G. W.

SIR JOHN RUSSELL'S POST

The Minister of Information has appointed Sir John Russell, D.Sc., F.R.S., the eminent scientist, to the post of Adviser to the Soviet Relations Branch of the Ministry of Information.

Sir John Russell, whose research in the field of agricultural science has brought him into close contact with Soviet scientists and agriculturists on many occasions, has travelled widely in the U.S.S.R., and at the recent conference of the British Association on science in the new world put forward proposals in regard to supply of seed and breeding stock for the U.S.S.R. after the liberation of the scorched earth from the German invaders.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Jan. 30th.—Meeting of the Sussex Division, N.V.M.A., at Brighton, 2 p.m.

Jan. 30th.—Annual General Meeting of the Royal Counties Division, N.V.M.A., at Oxford, 2.30 p.m.

Jan. 30th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds, 2.30 p.m.

Feb. 4th.—Meeting of the Section of Comparative Medicine of the Royal Society of Medicine, at 1, Wimpole Street, W.1, 2.15 for 2.30 p.m.

Feb. 5th.—Meeting of the Central Veterinary Society at the Conway Hall, W.C.1, 2.15 p.m.

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TYPOGRAPHICAL EXPEDIENTS TO MEET PAPER CONTROL REQUIREMENTS

Reduction in paper supplies is now operative for all periodicals, in common with other publications, and the "Paper Control" is already rigorous in its application to ourselves. So far as the printing of this journal is concerned, it has been decided to counter, so far as is possible, the consequent necessity for reducing the number of pages by the more extended employment of the smaller ranges of the type already in use, which was selected a few years ago, after an exhaustive examination of the resources of typography, with a view to the avoidance of eye strain. We are thus enabled, with a minimum of change, to preserve a reasonable degree of clarity and, assisted by the introduction of a wider measure for our columns, to retain for the present our customary features, largely unimpaired, on a much smaller paper allowance than we enjoyed during 1941.

We ask our readers to accept these inevitable changes with tolerance, as an effort to fill our diminished space in the manner involving the smallest sacrifice of useful matter. May we supplement this request with a special plea for brevity addressed to those of our correspondents—and indeed all our contributors—who are perhaps given to interpreting in too literal a sense their acknowledged right to freedom of expression.

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PERSONAL

Birth.—On December 24th, 1941, at Hatch Street Nursing Home, Dublin, to Kathleen, wife of E. V. Kelly, M.R.C.V.S., Kells, Co. Meath—a daughter.

Marriage.—Rowson-Foster, on January 8th, 1942, at St. Mary's Roman Catholic Church, Cannock, Staffs, Lionel Edward Aston Rowson, M.R.C.V.S., only son of Mrs. L. F. Rowson, of Doxey, Stafford, and the late Mr. Rowson, L.D.S., to Audrey Kathleen Foster, second daughter of Mr. and Mrs. H. Foster, of Melbourne House, Cannock.

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UNIVERSITY OF LONDON EXAMINATIONS IN VETERINARY SCIENCE

Following are the Pass Lists for the December, 1941, Examinations in Veterinary Science, and for the Degree of B.Sc. (Veterinary Science) of the University of London:—

Examinations in Veterinary Science

First Examination:

King, Anthony Stuart, Royal Veterinary College.

Maguire, Robert Daniel, Veterinary College and Royal Technical College, Glasgow.

Parker, Joseph, Veterinary College and Royal Technical College, Glasgow.

Usher, Francis James, Veterinary College and Royal Technical College, Glasgow.

SECOND EXAMINATION:

Halpin, Francis Brendan, Veterinary College of Ireland.
Macadam, Ian, Royal Veterinary College.

B.Sc. (Veterinary Science)

Evans, Esaiah Thomas Rees, Royal Veterinary College.
Hall-Patch, Peter Kenelm Joseph, Royal Veterinary College.
Paterson, Alexander Brown, Glasgow Veterinary College.
Rudland, Geoffrey Arthur Howard, Royal Veterinary College.

The following Student has passed in Part I:—
Purkis, Barbara Mary, Royal Veterinary College.

The following Students have passed in Part II:—
Boreham, Margaret Joan, Royal Veterinary College.
Jordan, Frank Tudor Whitney, Royal Veterinary College.

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MR. R. C. LOCKE AND THE SECRETARYSHIP OF THE N.V.B. AND MUTUAL DEFENCE SOCIETY

We are informed that Mr. Richard C. Locke, M.R.C.V.S., D.V.S.M., has been promoted by the Ministry of Agriculture Divisional Inspector (acting rank) and has been in charge of Division 53 (Monmouthshire) since the 14th instant. The pleasure with which we learn of this appointment is tempered by the knowledge that it involves his relinquishing the Hon. Secretaryship of the National Veterinary Benevolent and Mutual Defence Society, in which capacity Mr. Locke has rendered yeoman service over a long period. Mr. F. Hopkin, O.B.E., M.R.C.V.S., of 35, Manchester Road, Knutsford, Cheshire, is now acting in the dual capacity of Hon. Secretary and Hon. Treasurer of the Society.

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"WEYBRIDGE" TUBERCULIN

At a special meeting of the Executive Committee of the Scottish Association of Certified and T.T. Milk Producers, the opposition which had all along been maintained by the Association and by the corresponding English body to the manner in which Weybridge tuberculin was introduced for official use in May, 1940, was reviewed. The Committee considered that a cardinal error had been committed in introducing this form of tuberculin for official tests without first informing herd owners of the proposed change, and before complete scientific investigations regarding its effects had been carried out. Subsequent events, it was contended, had amply justified the Association's attitude.

It was decided that the Association should adhere to its present demand that no change in the tuberculin used for testing, or in the methods of testing should in future be made without prior discussion with herd owners and the veterinary profession. It was further decided that arrangements should be made whereby the veterinary surgeon who carried out the tests should be empowered to determine the results of the test.

It was reported that a meeting with representatives of the Animal Health Division of the Ministry had been arranged to take place in London, and that representatives from this Association, from the corresponding English Association, and the various Breed Societies would be represented. Dr. Chalmers Watson was appointed to represent the Association at that meeting with instructions to press the above stated demands.—*Farming News and North British Agriculturist.*

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WEEKLY WISDOM

Pre-war Agriculture

"*The main industry of the English countryside seemed to be the sale of refreshments. You could hardly see the woods for the teas. Never had the farmers sold so many beds-and-breakfasts, so many cups of tea, so many camping places for trailer-caravans; and they also did a little farming.*

"*It is amazing that so great a country and so great a nation, which is so sound at core, should be lulled and doped by golf and the pictures and radio and three-card-tricks in Parliament and all the other narcotics into deliberate oblivion of such things (the state of England's waste acres, derelict areas, slums, etc.)*" . . . *and, one might add, the state of disease among the farmer's cattle.*—Quoted portion from "A Prophet at Home" (Douglas Reed).

LEGAL NOTES

Bacon Factory to Pay for Pigs sent After Outbreak of Swine Fever.—At Leeds Assizes Mr. Justice Lewis gave his reserved judgment in an action brought by Mr. Raymond Kitson Poskitt, farmer, of South Milford, against the Yorkshire Farmers' Bacon Factory (1932), Ltd., for £331 2s. 3d., payment for 114 pigs sent by Mr. Poskitt for slaughter at the factory last February. Judgment was for Mr. Poskitt, for the full amount claimed, with costs.

In February last, Mr. Poskitt's piggeries having become infected with swine fever, an inspector of the Ministry of Agriculture judged 279 of his pigs to be healthy and made out a licence for their removal for immediate slaughter. All the pigs were sent to the bacon factory in lorries the same day. The defendant bacon factory company withheld payment for 114 of the pigs saying they were proved to be unfit for human food.

At the trial both sides agreed that Ministry of Food Regulations entitled Mr. Poskitt to payment in full if the pigs were apparently healthy at the time of loading, whether or not found to be healthy on arrival at the factory or after slaughter, but defendants said the condition of the pigs—or of some of them—when they arrived made it impossible for them to have been healthy when they left the piggeries a short time before.

Comparing the accounts given by witnesses on either side about the appearance of the pigs at the time of loading and the time of arrival at the factory, the Judge said he accepted the versions of Mr. Poskitt and his pigman, Mr. Brown, that the pigs were showing no signs of disease when being loaded.

If the stories told by defendants' witnesses—describing a shocking and ghastly condition of the animals—were true, then the whole factory must have been ringing with them, yet no complaint was made to Mr. Poskitt, who was present when the pigs were being unloaded, nor was any complaint on that ground made to him in correspondence for some time.

The defendants' witnesses' descriptions of the pigs' condition suggested that the animals were in the most disgusting state that could possibly be imagined—almost enough to make one's stomach turn on hearing the description in court. Yet at the time of unloading nobody seemed to have made more than a passing reference that the pigs were "in poor condition," which, in any event, Mr. Poskitt said he had noticed some days before.

The Judge said: "I regret to say that the persons who gave evidence as to the condition of the pigs when they were loaded did not impress me. . . . They have all been under the impression that if the pigs were unfit for human consumption when they got to the factory Mr. Poskitt would not be paid, but when they found that if the pigs showed symptoms of disease when they were loaded, then for the first time these witnesses say that was the condition of the pigs when they were loaded."

Doubtless the pigs, after slaughter, were unfit for human consumption, but he had no doubt, in spite of the volume of evidence against the plaintiff—at first sight imposing—that Mr. Poskitt was perfectly right in saying that the pigs, when he saw them off, were not suffering from symptoms which were apparent.

Mr. Poskitt's claim was entitled to succeed, quite apart from the evidence called. The certificate given to him by Mr. F. C. Scott, a perfectly capable and highly skilled veterinary officer of the Ministry of Agriculture, made it impossible to hold that the pigs were not healthy when Mr. Scott signed the document, which was acknowledged by the Ministry. —*Meat Trades Journal.*

* * * * *

Adulteration of Milk.—"The total inadequacy of the sentences and the variety of the decisions is astounding," said Sir Rhys Rhys-Williams, K.C., chairman of Glamorgan Quarter Sessions at Cardiff, in a reference to milk adulteration cases. "The adulteration of milk is, I consider, a very mean fraud. It is much too common and I think it ought to be stopped. I am going to ask for the co-operation of the magistrates in this county to try and stop it. It is a mean fraud on the people, but those who suffer most are the children. We have had communications from the Home Office pointing out the insufficiency of the sentences."

Sir Rhys went on to quote examples of recent decisions. In a case where deficiency in milk fat was 62 per cent., he said, the penalty was a fine of 5s. and £3 costs. In another case where the deficiency was 7 per cent., the defendant was ordered to pay 4s. costs and 10s. 6d. analyst's fee.

The Sessions decided to send a summary of the Chairman's remarks to all magisterial benches in the county.

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"BOVINE TUBERCULOSIS: A PLEA"

In view of the importance, from the point of view of public health, of the point raised therein, we reproduce the following contribution made under the above heading, to the *Meat Trades Journal* of December 25th, 1941:—

Some details of a case of congenital tuberculosis recently observed at the Public Abattoir, Coventry, and of subsequent investigations, have suggested some interesting and provocative thoughts on the law by which it was hoped to reduce the incidence of tuberculosis in this country.

On August 26th there was slaughtered a black calf, one of a large consignment from a nearby collecting centre. The calf was classified as a "first bobby," approximately seven days old, and dressed carcase weight was 36 lb. *Post-mortem* examination revealed numerous tuberculous lesions in the substance of the liver and spleen, in the visceral lymph glands and widespread infection of the carcase lymph glands.

In accordance with usual practice in Coventry in such cases the consignor was traced through the Chairman of Auctioneers responsible for the collecting centre by quoting number, sex, colour and classification of the calf. The foregoing particulars were telephoned direct to the office of the Divisional Inspector of the Ministry of Agriculture and Fisheries, written confirmation following through the usual channels, *i.e.*, the County Medical Officer.

A Ministry of Agriculture Veterinary Inspector visited the consignor's premises and examined a red cow, dam of the calf concerned. The cow was in a fair condition of nutrition, showed no abnormality of the udder, was not affected with chronic cough, showed no clinical symptoms of tuberculosis, nor did a smear prepared from the milk reveal any microscopic evidence of the tubercle bacillus. There was, however, a uterine discharge from which a smear was prepared for microscopic examination, which revealed the presence of tubercle bacilli.

It will be seen that this cow was not an "affected animal" within the meaning of the Tuberculosis Order, 1938, and it was learned that it was the intention of the owner to market the cow at an early date. It was also learned that the cow's previous calf, a yearling heifer, had recently been purchased by the Ministry of Food at a local collecting centre and investigation revealed the fact that it was found on slaughter to be affected with generalised tuberculosis. The owner was persuaded on the strength of this evidence to allow the cow to be slaughtered.

Accordingly the cow was admitted to the Coventry Abattoir on September 13th and slaughtered. The Ministry of Agriculture Veterinary Inspector was present at the *post-mortem* examination which showed an acute tuberculous pleurisy and peritonitis, with particularly heavy deposits on the serous membranes of the abdominal organs. A few scattered tuberculous foci were found in the visceral lymph glands, the walls of the uterus were much thickened with tuberculous nodules evenly and densely distributed. One horn of the uterus was almost completely replaced by caseous material and a diffuse tuberculous exudate covered the external membrane of the uterus. Ample evidence to indicate "advanced tuberculosis."

Admitting that the Tuberculosis Order has as its main object the eradication of advanced and highly infective cases of the disease, these details make it clear that by its limitations even this object is not attained. That the cow was a proved menace is obvious from the two young which had been traced. The possibilities of infection in other directions, from itself, its offspring, bulls which had served the cow, milkers, etc., dare hardly be contemplated.

Time of war is habitually advanced as an unpropitious occasion for revision of legislation, but the necessities of war economy surely demand that we must not continue the production of these reservoirs of disease at the cost of home-produced or imported foodstuffs, to say nothing of the waste of labour, time and money in other directions.

If we accept that compensation shall be paid to producers of milk and meat to encourage them to get rid of their tuberculous stock we should at least require that we should be able to deal with all demonstrably tuberculous animals either by slaughter or branding. At present, even when the harm done is proved, unless the animal conforms to the category of "affected animal" within the meaning of the Order, it may live and continue to spread disease, may even change hands without any declaration that tuberculosis has been demonstrated.

An amendment to the Order widening the definition "affected animal" and requiring the branding of all animals showing evidence of tuberculosis, so that such animals could be subjected to a policy of control and segregation and not allowed to remain as potential reservoirs of infection to their healthy fellows, should not be beyond our capabilities even in war-time.

Let us for one moment consider the position of the owner in the case under review: had he marketed the cow she would have brought him £40; slaughtered under the provisions of the Tuberculosis Order, £10; slaughtered in the interests of public health, nothing. Then consider that there is nothing in the Order to compel slaughter or to require any declaration of the evidence of tuberculosis in open market.

Our recent experience of the "culls" from the country's beef and dairy herds points unmistakably to the weakness of the Tuberculosis Order: such a deplorable collection of animals must have been a surprise even to the most pessimistic; that such a collection should have been allowed continued existence is amazing. That the slaughter of these animals must have a beneficial effect is unquestionable, but unless the law is strengthened where necessary the good effects may soon be negatived.

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SCIENCE AND THE DAIRY INDUSTRY POTENTIAL

At the conference of scientific workers, to which reference was made in our last issue, Professor Kay gave some figures of milk production which (comments *The Farmers' Weekly*) must blow away any mist of complacency which we may have allowed to linger.

"Much has been done by science for the dairy industry," said Professor Kay, "some has indeed been assimilated into practice, but the industry is still far below the potential to which existing scientific knowledge might raise her.

"Owing to our neglect to put into practice over the past decade our scientific knowledge of breeding and feeding for milk production, we are suffering seriously to-day because it is not possible with our present cows to make efficient use of the limited quantity of feeding stuffs that remain to us.

"Given the same limited quantity of food, by using good cows, say those giving 750 gallons of milk per year, we could obtain some 30 per cent. more milk than if we used the 450-500 gallon cow of the average herd to consume this same food."

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THE FUTURE OF FARMING: NEED FOR INTERNATIONAL CO-OPERATION

In a recent address at Newcastle-on-Tyne, Mr. R. S. Hudson, the Minister of Agriculture, said that it was no longer possible to think of farming only in national terms. The fortunes of farms in England were bound up with such events as a bumper wheat crop in Canada or the United States, or a sudden increase in the beef population of South America. For years we had seen the farmers of America solemnly undermining the fertility of their soil to send wheat to this country, only to get in return another depression while the despoliation of their soil had rendered English acres derelict. Where was the sense in it? Who could have conceived of a system, outside Bedlam, in which the fertility of centuries was plundered so that wheat might be thrown into the sea or burnt in railway engines?

Obviously, what was needed was organisation and co-operation by Governments and by farmers to provide on the one hand ample food supplies, and on the other hand a fair return to the primary producer and the maintenance of the fertility of the world's agricultural land. Mr. Hudson believed that this was being recognised by farmers in the United States, in the Dominions and in this country.

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SCOTTISH LIVESTOCK POSITION

Some interesting general figures were given regarding the livestock situation as disclosed by the statistics collected at the end of the year, by Sir Patrick Laird, Secretary of the Department of Agriculture for Scotland, at a recent Press conference in Edinburgh. The national dairy herd was very much the same as two years ago, but fewer cattle had been offered for slaughter than in 1940.

In the case of sheep the ewe flock was almost the same—a few per cent. less—as in December, 1940, which indicated that hill sheep men had made a pretty successful effort to rebuild their stocks. Another interesting point was that they had more young sheep at the end of December last than a year earlier, in spite of the fact that they had a much smaller lamb crop. The explanation seemed to be that they had not sold so many as fat this autumn. The open winter, so far, had probably helped towards this position. There was a considerable reduction in cast ewes this year—probably less than half. This was possibly because of deaths.

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THE RICKETTSIAS FURTHER SIMPLIFIED

"Gradually order is being established in our knowledge of the many infections caused by the rickettsias," states *The Lancet* in a recent issue, and continues: "Lewthwaite and Savoor[1] have shown conclusively that the scrub typhus of Malaya is identical with the tsutsugamushi disease of Japan. More recently they[2] have been able to prove that the mite fever of Sumatra is also identical with the Japanese disease. Tsutsugamushi is thus obviously a widespread infection in the Far East and since it was the first to be described its name should take precedence over such terms as mite fever, scrub or rural typhus. Alexander, Mason and Neitz,[3] working at Onderstepoort, have now thrown fresh light on the various typhus-like infections met with in South Africa. In order to compare the types of rickettsias found in that country they obtained the organisms from the blood of a dog with a febrile reaction, from ticks (*Hyalomma aegyptium*) found on a hare (*Lepus saxatilis*), from the blood of a patient with tick-bite fever, from rats, and from ticks (*Rhipicephalus sanguineus*) collected from dogs in Tunis. The morphological, staining and growth characteristics of these various rickettsias were compared, as were the experimental diseases in the guineapig, rat, mouse, rabbit, dog, sheep and ox. Rat typhus could be maintained in the guineapig and rat but not in the sheep, dog or mouse. The rickettsias from the ticks of the hare could easily be passaged in guineapigs, but those from dog ticks in Tunis and from the human case of tick-bite fever produced constant reactions in guineapigs only when cultures from the chorio-allantoic membrane of the developing chick embryo were employed. Finally, cross-immunity tests were carried out in guineapigs. These showed that murine typhus immunised against itself and to a great extent against the other four rickettsial diseases. The four other strains, however, produced reciprocal cross-immunity, but did not immunise against murine typhus. The rickettsias thus fall into two groups. In the first is the murine or rat typhus which appears to be identical with that seen in Europe and the New World. The other four strains from South African tick-bite fever of man, from dogs in Tunis and South Africa, and from the ticks on the South African hare are all closely related and probably identical. The question of nomenclature thus becomes important. Since the term tick-bite fever has become well established in South Africa it is difficult to replace it either by the French name "fièvre boutonneuse" or by the American "Rocky Mountain spotted fever." Alexander and his colleagues therefore suggest that these three conditions should all be included in the spotted-fever group while for the causative organism of South African tick-bite fever they propose the name *Dermacentroxenus rickettsi* var. *pijperi* in honour of Dr. Pijper of Pretoria who is the pioneer in investigating the rickettsial diseases of man in South Africa. This departure in nomenclature renders certain additional modifications necessary: thus the name *D. rickettsia* var. *conori* is suggested for the rickettsia causing fièvre boutonneuse in North Africa and the Mediterranean zone. Further, the generic name "Rickettsia" cannot be allowed for what are at present called *Rickettsia ruminantium, R. bovis, R. ovina* and *R. canis*. Since these rickettsias of ruminants and the dog differ both morphologically and biologically from those of the typhus-spotted-fever group, the separation is well merited. The difference in morphology can be easily appreciated by a comparison of the photomicrographs illustrating Alexander and Mason's papers with that given by Schulz[4] in his communication of the discovery of *R. ovina* in South Africa. It is questionable also whether the rickettsias of Australian and American Q fever should not be placed in a separate genus. The general name "rickettsia" and "rickettsiosis" could however be retained since all would obviously be specific genera of the family Rickettsiaceae."

(1) Lewthwaite, R. and Savoor, S. R. *Lancet*. (1940.) **1**. 255. 305.
(2) Lewthwaite and Savoor. *Brit. J. exp. Path.* (1940.) **21**. 117.
(3) Alexander, R. A., Mason, J. H. and Neitz, W. O. *Onderstepoort J. Vet. Sci.* (1939.) **13**. 119. Alexander and Mason. *Ibid.* p. 25. Mason and Alexander. *Ibid.* pp. 41 and 67.
(4) Schulz, K. *Ibid.* p. 287.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue. *The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.*

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LOIN CLOTHS FOR HORSES

To the Editor of the Veterinary Record

Sir,—This cold weather has brought to the fore the question of loin cloths for horses. I believe that there is some divided opinion as to whether it is beneficial or not to place these on animals during severe winter weather, or in fact, at any time during the winter season.

I should appreciate the views and assistance of your readers on this subject.

Yours faithfully,
E. Keith Robinson,
Governor and Secretary,
Our Dumb Friends' League.

Grosvenor Gardens House,
Victoria,
London, S.W.1.
January 16th, 1942.

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"THROW-BACKS"

To the Editor of the Veterinary Record

Sir,—Is there any real foundation for the belief in some circles that as a result of mésalliance of pedigree and non-pedigree parents, "throw-backs" occur in a subsequent mating of pedigree parents? I have often heard it asserted that such is the case, but in a fairly long experience I have never seen "throw-backs" in any animals.

Yours truly,
G. Mayall.

24, Pool Street,
Bolton.